

Remarks

Applicant respectfully request reconsideration of the present application in view of the foregoing amendments and the following remarks. Claims 1-11, 17, 19 are pending in the application. Claims 1-11, 17 and 19 are rejected. Claims 2, 9 and 22-29 have been canceled without prejudice with this amendment. Claims 12-16, 18, and 20-21 have previously been canceled without prejudice. No claims have been allowed. Claims 30-37 have been added. Claims 1, 7, 8, and 19 are independent.

Restriction/Election

The Examiner imposes a four-way restriction requirement as follows:

Group I – Claims 1-11, 17 and 19;

Group II – Claims 22-26;

Group III – Claim 27; and

Group IV – Claims 28-29.

Applicants elect Group 1, which includes claims 1-11, 17 and 19.

Claim Objections

The Action objects to claims 1-6 due to minor informalities. The Action indicates that claim 1, lines 1-3 were considered by the Office to read as “A computer executable and semantically accessible state binding method, the method comprising...” Applicants appreciate the Office’s willingness to modify the claims to provide a reading that can be examined. However, Applicants respectfully submit that the Independent claim language should have been read as written by the Applicants. In response to the informalities mentioned by the Office, Applicants have modified the claims 1-6 such that the preamble of each now reads: “A computer readable medium having computer-executable software code carried thereon for executing on a computing device for saving state for a semantically accessible state binding method...” Applicants respectfully submit that the claims in their current form overcome the objections of the Office and that the original preamble of Claim 1 should stand.

Furthermore, Applicants have amended claims 3-5 in the manner kindly suggested by the Examiner, adding the word “state” in front of “frame” as necessary.

Specification Objections

The Action objects to the Specification due to minor informalities. The Specification has been modified to spell out the Acronyms noted by the Examiner.

The Office mentions that trademarks are used in this application. Applicants respectfully note that the uses in the application are capitalized and that such uses are accompanied by generic terminology. For example, the mentions of .Net and Windows on page 6 of the specification refer to them in the context of a programming framework language.

35 U.S.C. § 102(b) Rejections of Claim 1

The Action rejects claim 1 under 35 USC 102(b) as being anticipated by U.S. Published Patent Application No. 2004/0148603 to Baylis (Baylis). For a 102(b) rejection to be proper, the cited art must show each and every element as set forth in a claim. (*See* MPEP § 2131.01.) However, the cited art does not describe each and every element in the amended claims. Accordingly, Applicants request that all rejections be withdrawn.

Claim 1.

Amended claim 1 recites, in part:

wherein the executing program saves a first state of the program in the first state frame as a semantically accessible first state object, saves a second state of the program in the second state frame as a semantically accessible second state object, and then returns to the first state of the program by using the first state object.

For example, the specification describes exemplary embodiments of semantically accessible state objects as follows:

In one sense, being a first-class citizen means being semantically accessible by a program or modeling language. An instantiated state mechanism or object is given a name that can be referred to in a program. For example, in Table 2, the state object “s” is created, and then later, possibly used in some error condition test to reset the program to the state at the time “s” was declared. In this example, “State.Fork()” saves the state in “s”, and “s.set ()” returns the program to the state saved at “s”. Specification, page 9, lines 7-12.

Applicants believe, after carefully examining Baylis, that Baylis does not teach or suggest at least, the claim language “wherein the executing program saves a first state of the program in the first

state frame as a *semantically accessible first state object*.” Baylis does not discuss semantically accessible state objects, as Applicants understand.

Baylis also, therefore does not teach or suggest the additional claim features *wherein the executing program ... saves a second state of the program in the second state frame as a semantically accessible second state object*; and also does not teach or suggest *wherein the executing program ...then returns to the first state of the program by using the first state object*. Accordingly, favorable reconsideration and withdrawal of the rejection of independent claim 1 under 35 U.S.C. § 102(b) are respectfully requested.

35 U.S.C. § 103(a) Rejections of Claims 1-6

The Action also rejects claims 1-6 under 35 USC 103(a) as being anticipated by U.S. Patent No. 7,003,770 to Pang et al. (Pang) in view of U.S. Published Patent Application No. 2004/0168078 to Brodley et al. (Brodley). To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. (MPEP § 2142.)

However, the cited art does not describe each and every element in the amended claims. Accordingly, Applicants respectfully request that all rejections be withdrawn.

Claim 1.

Amended claim 1 recites, in part:

after the fork method creates the third state frame, value of a variable of the executing program can be accessed by checking, in backwards order that the frames were created, for the value of the variable in the respective frames.

The amendment is supported by the Specification and figures as originally filed. For example, the specification recites:

A state component represents update sets as frames holding the updates created in the current step linking backwards to frames of earlier updates. When a value for a particular variable is retrieved in the current state, the frames are walked backwards until an update for that variable is found. Specification, page 4, lines 16-19.

Applicants believe, after carefully examining Pang, that Pang does not teach or suggest at least “value of a variable of the executing program can be accessed by checking, in backwards order that the frames were created, for the value of the variable in the frames.” Pang teaches a process with multiple threads in a process, each thread with its own context frame. *See*, Pang, col. 4, lines 4-8. The context frames do not share data between them. Rather, “the data and program code of a process are stored in a heap and a program area respectively and are shared by all the threads within the process.” Pang, col. 4, lines 47-50. Data being shared by all threads teaches against looking in a frame for a variable value in a different frame; thus, Pang teaches against the claim 1 language “value of a variable of the executing program can be accessed by checking, in backwards order that the frames were created, for the value of the variable in the frames.”

Applicant respectfully submits that Brodley does not add anything to the disclosure of Pang that would remedy the aforementioned deficiency.

Also, Applicant respectfully submits that one of ordinary skill would not have been motivated to combine Pang with Brodley.

Accordingly, favorable reconsideration and withdrawal of the rejection of independent claim 1 under 35 U.S.C. § 103(a) are respectfully requested.

Claims 3-6.

Additionally, claims 3-6 depend from claim 1. In the interest of brevity, Applicants do not belabor the language of each of the dependent claims, but points out that they recite novel and nonobvious features allowable over the proposed Pang - Brodley combination. Further, since they depend from claim 1, they should be allowed for at least the reasons stated for claim 1. Moreover, one of skill in the art would not be motivated to combine Pang with Brodley. Claims 3-6 should be allowable for at least the reasons given. Such action is respectfully requested.

35 U.S.C. § 103(a) Rejections of Claims 7 and 17

The Action rejects claims 7 and 17 under 35 U.S.C. 103(a) as being unpatentable over Baylis in view of U.S. Patent No. 7,194,743 to Hayton et al. (Hayton). However, the cited art does not describe each and every element in the claims. Accordingly, Applicants respectfully request that all rejections

be withdrawn.

Amended claim 7 recites in part:

receiving via an application programming interface a request to create a state save;
in response to the request, saving a first representation of a state of an executing program comprising copying state of the program required to return to the moment the state was saved as a first state frame; ...
changing the current state frame to the first state frame upon receiving a state set request at the application programming interface.

The Office, in its rejection of claim 7 states: “Baylis does not explicitly disclose *receiving via an application programming interface a request to create a state save* and *receiving a state set request at the programming interface*.” Applicants respectfully agree. However, Applicants respectfully disagree that Hayton so shows.

The amended language of the claim requires “changing the current state frame to the first state frame *upon receiving* a state set request at the application programming interface.”

The Action cites to three separate sections of Hayton to teach or suggest the above claim language, none of which do so.

1) Hayton 12:3-39. This discusses obtaining “the present state, (i.e., value)” of a specific property by an application programming interface using a property path to locate “the present state, (i.e., value)” of an **existing** property by following a property path. [Hayton 12:11.] It does not “create a save state” as the property value already exists. As it does not “create a save state,” likewise, it does not teach or suggest the additional features “receiving via an application programming interface a request to create a state save.” Additionally, it does not teach or suggest “changing the current state frame to the first state frame *upon receiving a state set request at the application programming interface*” as it does not receive a state set request.

2) Hayton 30:38-31:8. This discusses an application programming interface (the one shot operation issued by a client) “send[ing] the saved application state to the server 60 along with the list of properties that the client is interested in.” [Hayton 30:38-41.] That is, the application programming interface does not send a “*request to create a state save*.” Rather, the application programming interface saves the application state itself.

3) Hayton 3:27-44. This discusses a way for a client node with an older version of a Web

browser to mimic newer functionality. A proxy browser receives an interactive page, and converts it into a static form useable by the client browser. When a user clicks on a link, if a specific property changes, the proxy sends the change to a server which generates a new page for the client node to display. Hayton does not teach or suggest “*changing the current state frame to the first state frame* upon receiving a state set request at the application programming interface” as there is no first state frame to reset the executing program to. When a property is changed, a *new* page is generated.

The following amended claim 7 features are also not taught or suggested by Baylis or Horton, as well.

- creating a blank state frame with a backward link to the first state frame as a current state frame;
- in response to a request for value of a variable after the request to create a state save, checking for the value of the variable in the first state frame;

Baylis is cited for its alleged disclosure of various features of claim 7 other than the aforementioned features. Applicant respectfully submits that Baylis does not add anything to the disclosure of Hayton that would remedy the aforementioned deficiency, as mentioned by the Office.

Also, Applicant respectfully submits that one of ordinary skill would not have been motivated to combine Baylis with Hayton.

Accordingly, favorable reconsideration and withdrawal of the rejection of independent claim 7 and its dependent claim 17 under 35 U.S.C. § 103 are respectfully requested.

35 U.S.C. § 103(a) Rejections of Claims 8-11

The Action rejects claims 8-11 under 35 U.S.C. 103(a) as being unpatentable over Baylis in view of U.S. Patent No. 6,510,448 to Churchyard (Churchyard).

Claim 8.

Amended Independent claim 8 recites in part:

the program including a method for locating a value updated in the first frame and not present in the second frame by following a back pointer from the second frame to the first frame, reading the location value from the first frame and storing the location value in the second frame.

Applicants respectfully submit that the asserted Baylis-Churchyard combination, at a minimum, does not teach or suggest the above language.

Baylis describes program threads whose executing instructions are stored in a table. The program threads access this table through a pointer. A replacement table with different instructions is also available. This table has instructions which make the state of the programming thread available “for subsequent use.” [Baylis, ¶ 18.] When the state of a program thread is to be saved, an instruction is inserted into the thread table replacing the pointer to the original table with a pointer to the replacement table, such that after the swap, the thread begins reading instructions from the replacement table to place the threads in a consistent state. [Baylis, ¶¶ 20, 21.] When the replacement table instructions are accessed by a thread, the thread is instructed to store its state in an “execution environment stored in memory external to the processor core.” [Baylis, ¶ 32.]

In ¶ 28, Baylis discusses a method to replace the original table pointer with the replacement pointer. The “modified pointer to the relevant entry” refers to the replacement pointer pointing to the replacement table, such that subsequent program threads will use the replacement pointer to read the replacement table entries. This is performed by a “rendezvous module.”

In ¶ 29, Baylis discusses the necessity of program threads being in a “consistent state” when garbage collection is performed. A “consistent state” is described at ¶ 19 as the corresponding thread instructions having completed execution and the subsequent thread instructions not having begun execution. The “consistent state” is then made available to the garbage collection process, presumably to ensure that it does not destroy any values that are currently being used. The consistent state can also be used to allow a switch between threads.

In ¶ 56, Baylis discusses that when multiple threads are running simultaneously, they each must be put in a consistent state prior to switching between them. “This then ensures that the necessary state information is available for each Java thread when that Java thread is subsequently switched to by the Java VM 60.” [Baylis, ¶56.]

In ¶ 57, Baylis talks about how when only a single thread is running, the thread does not need to be “put” into a consistent state prior to garbage collection, as it is already in a consistent state. But, if an external event (such as a debugging event or a thread switch timer expiring) asks for the consistent state (invocation of the rendezvous module) then the table pointer is replaced with the replacement table pointer, causing the replacement table instructions to be read, as described above (the rendezvous module manipulating the table pointer).

Thus, as Applicants understand, Baylis discusses a thread saving its state to external memory.

However, the saved state is only used by either the thread itself to continue execution, or by an outside process, such as a garbage collection process.

This does not teach or *suggest* “*the program including a method for locating a value updated in the first frame and not present in the second frame by following a back pointer from the second frame to the first frame, reading the location value from the first frame and storing the location value in the second frame*” as the state itself as saved is not modified once saved. Further different saved states do not interact, let alone “locating a value in the first frame not present in the second frame.” Rather, threads are put in a consistent state prior to switching, so no modification of the state is needed. [Baylis, ¶28-29.]

Churchyard is cited for its alleged disclosure of various features of claim 8 other than the aforementioned feature. Applicant respectfully submits that Churchyard does not add anything to the disclosure of Baylis that would remedy the aforementioned deficiency.

Also, Applicant respectfully submits that one of ordinary skill would not have been motivated to combine Baylis with Churchyard.

Accordingly, favorable reconsideration and withdrawal of the rejection of independent claim 8 under 35 U.S.C. § 103 are respectfully requested.

Claims 10-11.

Additionally, claims 10-11 depend from claim 8. In the interest of brevity, Applicants do not belabor the language of each of the dependent claims, but points out that they recite novel and nonobvious features allowable over the proposed Baylis - Churchyard combination. Further, since they depend from claim 8, they should be allowed for at least the reasons stated for claim 8. Moreover, one of skill in the art would not be motivated to combine Baylis with Churchyard. Claims 10-11 should be allowable for at least the reasons given. Such action is respectfully requested.

35 U.S.C. § 103(a) Rejections of Claim 19

The Action rejects claim 19 under 35 U.S.C. 103(a) as being unpatentable by Baylis in view of U.S. Patent No. 6,014,666 to Helland et al. (Helland). However, the cited art does not describe each and every element in the claims. Accordingly, Applicants respectfully request that all rejections be withdrawn.

Amended claim 19 recites in part:

*saving a first representation of a state of the executing model as a first state frame;
creating a blank state frame with a backward link to the first state frame as a second state
frame....*

The amendment is supported by the Specification and figures as originally filed. Applicants believe, after examining Helland, that Helland does not teach or suggest at least, the claim 19 language recited above. Helland, does not create a blank state frame, and so also does not create a blank state frame with a backward link.

Applicants also believe, after examining Baylis, that Baylis also does not teach or suggest at least, the claim 19 language recited above. Baylis, also, does not create a blank state frame, and so also does not create a blank state frame with a backward link.

Also, Applicant respectfully submits that one of ordinary skill would not have been motivated to combine Helland with Baylis.

Accordingly, favorable reconsideration and withdrawal of the rejection of independent claim 19 under 35 U.S.C. § 103(a) are respectfully requested.

Missing Initialed Form 1449

On December 6, 2006, the Applicants submitted an Information Disclosure Statement listing one reference. The Applicants have not yet received an initialed form 1449 for this IDS. The Applicants respectfully request that the Examiner provide the initialed form 1449 for this IDS. See MPEP § 609 (“An information disclosure statement filed in accordance with the provisions of 37 CFR 1.97 and 37 CFR 1.98 will be considered by the examiner assigned to the application.”).

Amendments and New Claims

Support for the amendments and new claims can be found throughout the application as originally filed. In addition, support can be found at, e.g., pages 2, 5, 6, 13, 23, 24, Figures 1, 4, 5, 7, 9, and 11.

Formal Request For Interview

Upon reviewing this response, if any issues remain, the Examiner is formally requested to contact the undersigned prior to issuance of the next Office Action in order to arrange a telephonic

interview. It is believed that a brief discussion of the merits of the present application may expedite prosecution. Applicants submit the foregoing formal Response so that the Examiner may fully evaluate Applicants' position, thereby enabling the interview to be more focused. This request is being submitted under MPEP § 713.01, which indicates that an interview may be arranged in advance by a written request.

Conclusion

The claims should be allowable. Such action is respectfully requested.

Respectfully submitted,

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